**SA WG2 Meeting #163 S2-2406347**

**May 20 - 31, 2024 Jeju, South Korea (Revision of S2-240xxxx)**

**Source: China Mobile**

**Title: KI #7, Conclusion for KI#7**

**Document for: Approval**

**Agenda Item: 19.2**

**Work Item / Release: FS\_NG\_RTC\_Ph2 / Rel-19**

*Abstract of the contribution: This contribution provides conclusion for key issue #7.*

# 1 Discussion

This contribution provides the conclusion for KI#7.

# 2 Proposal

It is proposed to capture the following contents into TR 23.700-77.

*FIRST CHANGE*

# 8 Conclusions

## 8.X Conclusion of KI#7

The following conclusions for KI#7 "Support multiplexing multiple DC applications over single SCTP connection" are agreed:

The solution #22 in TR 23.700-77 is taken as the the basis to form the solution principle.

The following multiplexing scenarios are supported in this release:

- Multiplexing a SDP media description by local bootstrap data channel and remote bootstrap data channel between the UE and its home IMS network;

- Multiplexing a SDP media description by different application data channels for applications with same QoS requirements between the UE and its IMS network;

- Multiplexing a SDP media description by different application data channels for applications with same QoS requirements between the originating IMS network and terminating IMS network if both support DC multiplexing capability.

- The data channels using the same stream ID are not multiplexed.

The following de-multiplexing scenarios are supported in this release:

- The IMS network de-multiplex local bootstrap data channel and remote bootstrap data channel from a SDP media description for the UE;

- The IMS network de-multiplex application data channels with different endpoints from a SDP media description;

- The originating IMS network de-multiplex data channels towards remote network if the remote network does not support DC multiplexing.

The Rel-18 IMS DC architecture is reused without introducing new NF. The UE supporting data channel multiplexing initiates a session with multiplexed SDP. When the IMS AS receives multiplexed SDP, it informs the DCSF to decide whether the multiplexed data channels needs to be de-multiplexd and instructs the MF via IMS AS to reserve the corresponding media resource. The originating DSCF decides whether to de-multiplex the data channels based on whether the terminating network supports multiplexing.

The UE and IMS network support DC multiplexing capability discovery as follows:

- The UE and its home IMS network mutually negotiate their capability of DC multiplexing during registration procedure.

- If the UE and P-CSCF support DC multiplexing, when the UE registers on the IMS network, the UE and P-CSCF include a Feature-Caps header field indicating its capability of supporting standalone data channel in the REGISTER request;

- If the home IMS network supports this feature, the S-CSCF includes a Feature-Caps header field indicating its capability of supporting DC multiplexing in the 200 OK response to the initial and any subsequent REGISTER request.

NOTE: The P-CSCF and IMS-AGW need to support the multiplexed SDP to not gating the multiplexed media but the P-CSCF and IMS-AGW does not change the multiplexed SDP and media.

- The originating IMS network discovers the DC multiplexing capability by local configuration or based on the SDP answer from remote network.

NOTE: The IMS network can be configured to only allow multiplexing data channels between the UE and the IMS network, i.e. on UNI interface.

If the DC multiplexing is used between originating UE and originating IMS network, when the originating UE generates SDP offer in INVITE or re-INVITE request, the DC stream IDs associated with the data channels to be multiplexed and the application ids combined with the data channels are included in the SDP offer for a single m line.

NOTE: How the application id and the DC stream IDs are included in the SDP is specified in SA4.

When receiving SDP offer with multiplexed data channels, the originating IMS AS reports to the DCSF and the DCSF determines if the multiplexed data channels needs to be de-multiplexed, based on the capability of the remote IMS network, or the endpoints of the data channels:

- If the data channels are kept multiplexed, the DCSF instructs originating IMS AS and originating IMS AS further instruct the MF to reserve the same media termination for multiplexed data channels;

- If the data channels is determined to be de-multiplexed, the DCSF instructs originating IMS AS and originating IMS AS further instructs the MF to reserve separate media terminations for the de-multiplexed streams. When theoriginating IMS AS sends the SDP offer to terminating IMS network, the data channels are not multiplexed in the SDP offer.

When receiving SDP offer with multiplexed data channels, the terminating IMS AS reports to the DCSF and the DCSF determines if the multiplexed data channels needs to be de-multiplexed, based on the capability of the terminating UE, or the endpoints of the data channels:

- If the data channels are kept multiplexed, the DCSF instructs terminating IMS AS and terminating IMS AS further instruct the MF to reserve the same media termination for multiplexed data channels;

- If the data channels is determined to be de-multiplexed, the DCSF instructs terminating IMS AS and terminating IMS AS further instructs the MF to reserve separate media terminations for the de-multiplexed streams. When the terminating IMS AS sends the SDP offer to terminating UE, the data channels are not multiplexed in the SDP offer.

When the IMS AS selects a MF or MRF supporting data channel multiplexing, it includes data channel multiplexing indication in the Nnrf\_NFDiscovery\_Request service operation.

The services of IMS AS and MF needs updates to support DC multiplexing and de-multiplexing, which is specified during normative phase.

The following impacts on services is considered during normative phase:

- The offer/answer supports the required functionality to handle Multiplexing subscription.

- The notification to DCSF is enhanced to inform the received multiplexed SDP during the SDP offer/answer negotiation. Application IDs, Application DC type such as P2A or P2P, assistance information for SCTP connection setting may be also considered.

- The IMS AS services are enhanced to allow the DCSF instruct the IMS AS of the corresponding media descriptions based on whether the remote network supports multiplexing.

- The MF services are enhanced to support the media instructions for multiplexing data channels.

*End of CHANGES*